

Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claims 1-2 (cancelled)

Claim 3 (new): A system operative to detect a damage feature in a thin wall structure, said system comprising:

an array of piezoelectric wafer sensors embedded on said structure in a predetermined pattern;

a generator operative to excite at least one of said sensors to produce ultrasonic waves having a frequency of at least about 200 KHz in said structure; and

a signal processor operative to process received signals at least two of said sensors so as to detect said damage feature.

Claim 4 (new): A system as set forth in claim 3, wherein said generator is operative to excite each of said sensors in said array in round-robin fashion.

Claim 5 (new): A system as set forth in claim 4, wherein said signal processor is operative to determine a location of said damage feature based on a collection of data representing received signals at a plurality of said sensors after round-robin excitation of all of said sensors in said array.

Claim 6 (new): A system as set forth in claim 4, wherein said array comprises at least four of said sensors.

Claim 7 (new): A system as set forth in claim 3, wherein said frequency of said ultrasonic waves include a significant component at approximately 300 KHz.

Claim 8 (new): A system as set forth in claim 7, wherein said ultrasonic waves are Lamb waves.

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Claim 9 (new): A system as set forth in claim 3, wherein said frequency of said ultrasonic waves falls in the megahertz range.

Claim 10 (new): A system as set forth in claim 3, wherein said ultrasonic waves are Lamb waves.

Claim 11 (new): A system as set forth in claim 10, wherein said sensors are adhered to a surface of said thin wall structure.

Claim 12 (new): A system as set forth in claim 3, wherein said wafer sensors have a planar surface area no greater than approximately 169 mm^2 and a thickness no greater than approximately 0.49 mm.

Claim 13 (new): A system as set forth in claim 12, wherein said wafer sensors are generally rectangular.

Claim 14 (new): A system operative to detect a damage feature in a structure, said system comprising:

an array of piezoelectric wafer active sensors embedded on said structure in a predetermined pattern, said wafer sensors having a planar surface area no greater than approximately 169 mm^2 and a thickness no greater than approximately 0.49 mm;

a generator operative to excite each of sensors in said

array in round-robin fashion to produce ultrasonic waves in said structure; and

a signal processor operative to process received signals at least two of said sensors so as to detect said damage feature.

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Claim 15 (new): A system as set forth in claim 14, wherein said signal processor is operative to determine a location of said damage feature based on a collection of data representing received signals at a plurality of said sensors after round-robin excitation of all of said sensors in said array.

Claim 16 (new): A system as set forth in claim 14, wherein said array comprises at least four of said sensors.

Claim 17 (new): A system as set forth in claim 14, wherein said frequency of said ultrasonic waves falls in a range of 200 kHz to high megahertz.

Claim 18 (new): A system as set forth in claim 17, wherein said frequency of said ultrasonic waves is approximately 300 KHz.

Claim 19 (new): A system as set forth in claim 18, wherein said ultrasonic waves are Lamb waves.

Claim 20 (new): A system as set forth in claim 14, wherein said sensors are adhered to a surface of said thin wall structure.

Claim 21 (new): A method of detecting impact to a structure by a foreign object, said method comprising steps of:

(a) providing an array of piezoelectric wafer sensors embedded on said structure in a predetermined pattern;

(b) simultaneously monitoring said sensors in said array to

detect impact signals caused by stress waves produced in said structure by said foreign object; and

(c) processing a collection of said impact signals so as to ascertain a location of said impact.

Claim 22 (new): A method as set forth in claim 21, wherein said sensors are simultaneously monitored in step (b) on a continuous basis.

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Claim 24 (new): A method as set forth in claim 21, wherein said array comprises at least four of said sensors.

Claim 25 (new): A method as set forth in claim 24, wherein said wafer sensors have a planar surface area no greater than approximately 169 mm² and a thickness no greater than approximately 0.49 mm.

Claim 26 (new): A method as set forth in claim 25, wherein said wafer sensors are generally rectangular.

Claim 27 (new): A method as set forth in claim 21, further comprising the following steps:

(d) exciting at least one of said sensors to produce ultrasonic waves having a frequency of at least 200 KHz in said structure; and

(e) detecting said ultrasonic waves at said sensors so as to ascertain the presence of damage features in said structure.

Claim 28 (new): A method of detecting a damage feature

present within a predetermined sensing zone in a thin wall structure, said method comprising steps of:

(a) providing at least one piezoelectric wafer sensor embedded on said structure;

(b) exciting said sensor with a first electrical signal spanning a predetermined frequency range;

(c) deriving first data characteristic of a drive-point impedance of said wafer sensor as embedded on said structure;

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(d) exciting said sensor with a second electrical signal spanning said predetermined frequency range;

(e) deriving second data characteristic of said drive-point impedance of said wafer sensor; and

(f) comparing said first data and said second data.

Claim 29 (new): A method as set forth in claim 28, wherein a plurality of said wafer sensors are provided on said structure in an array.

Claim 30 (new): A method as set forth in claim 29, wherein said sensors are arranged in said array so as to have overlapping sensing zones.

Claim 31 (new): A method as set forth in claim 30, wherein said wafer sensors have a planar surface area no greater than approximately 169 mm² and a thickness no greater than approximately 0.49 mm.
